

**Estimated Fish Consumption Rates for the U.S.  
Population and Selected Subpopulations  
(NHANES 2003-2010)**

**Appendix A**

**Habitat Apportionment Documentation**

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
Abalone	1	0	0	100% Marine
Anchovy	0	0	1	100% Estuarine
Barracuda	1	0	0	100% Marine
Carp	0	1	0	100% Freshwater
Carp				100% freshwater
Bream		≈100% freshwater, but not in US waters; very rarely consumed in US (not in NOAA import data); 0 recorded in 2007-08 NHANES AMPM file)		
Buffalofish				100% freshwater
Sucker				100% freshwater
Catfish	0	0.9	0.1	Apportioned with NOAA landings data.
Blue catfish				80% FW/20%Est, 40% of total catch
Channel catfish				100% FW, 32% of total catch
Flathead catfish				100% FW, 3.6% of total catch
Catfishes and Bullheads				catch-all category, apportioned according to above catch proportions, 24% of total catch
Clam	0.84	0	0.16	Apportioned with NOAA landings data.
Arc/Blood clam				100% Est, <0.5% of total catch
Atlantic jackknife clam				100% Est, <0.5% of total catch
Atlantic surf clam				100% marine, 41.9% of total catch
Butter clam				100% Est, <0.5% of total catch
Manila clam				100% Est, 1% of total catch
Northern quahog clam				100% Est, 4.9% of total catch
Ocean quahog clam				100% marine, 35.4% of total catch
Pacific geoduck clam				100% Est, 3.1% of total catch
Pacific littleneck clam				100% Est, <0.5% of total catch
Pacific razor clam				100% Marine, <0.5% of total catch
Pacific gaper clam				100% Est, <0.5% of total catch
Quahog clam				100% Est, 0.7% of total catch
Softshell clam				100% Est, 4.8% of total catch
Clams or Bivalves				catch-all category, apportioned according to above catch proportions, 7.8% of total catch
Cod	1	0	0	100% Marine
Conch	1	0	0	100% Marine
Crab	0.273	0	0.727	
Atlantic rock crab				100% Marine, 0.9% of total catch
Blue crab				100% Est, 52.2% of total catch
Blue peeler crab				100% Est, 0.5% of total catch
Blue soft crab				100% Est, <0.5% of total catch
Blue crab, soft and peeler				100% Est, <0.5% of total catch
Deepsea golden crab				100% Marine, <0.5% of total catch
Deepsea red crab				100% Marine, <0.5% of total catch

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
Dungeness crab				100% Est, 18.1% of total catch
Florida stone claws crab				50% Est/50% Marine (2 species), 1.5% of total catch
Green crab				100% Est, <0.5% of total catch
Horseshoe crab				used for bait and fertilizer, not consumed by humans
Jonah crab				100% Marine, 2.7% of total catch
King crab				100% Marine, 6.5% of total catch
Red rock crab				100% Est, <0.5% of total catch
Snow crab				100% Marine, 14.9% of total catch
Southern tanner crab				100% Marine, 0.8% of total catch
Spider crab				100% Marine, <0.5% of total catch
Crabs				catch-all category, apportioned according to above catch proportions, 0.8% of total catch
<b>Crayfish</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>100% Freshwater</b>
<b>Croaker</b>	<b>0.071</b>	<b>0.05</b>	<b>0.879</b>	
Croaker				Apportioned with NOAA landings data. Atlantic Croaker (estuarine) 99.6% of total catch. Pacific croaker (marine) <0.5% of total catch. Weighted* 35% of group.
Angelfish				Aquarium fish, not consumed in US
Butterflyfish				Aquarium fish, not consumed in US
Drumfish				100% Estuarine (estuarine and marine caught near-shore) Weighted 10% of group.
Goatfish/Weke				90% Marine/10% Estuarine (one Hawaiian species is estuarine) Weighted 5% of group.
Kingfish				100% Estuarine (estuarine and marine caught near-shore) Weighted 25% of group.
Sea trout				100% Estuarine (estuarine and marine caught near-shore) Weighted 5% of group.
Freshwater Sheepshead/Goo/Gaspergou				100% Freshwater Weighted 5% of group.
Spadefish				2 popular food species in US, one is estuarine/marine the other is marine. NOAA landings database does not speciate. Assume 50% estuarine and 50% Marine. Weighted 5% of group.
Spot				100% Estuarine (estuarine and marine caught near-shore) Weighted 5% of group.
Surgeonfish				Aquarium fish, not consumed in US
Weakfish				Marine and estuarine species. Weighted 5% of group.
<b>Eel</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>100% Freshwater</b>
<b>Flatfish</b>	<b>0.87</b>	<b>0</b>	<b>0.13</b>	<b>Apportioned with NOAA landings data.</b>
FLOUNDER, ARROWTOOTH				100% Marine, 15.8% of total catch
FLOUNDER, FOURSPOT				100% Marine, <0.5% of total catch
FLOUNDER, PACIFIC, SANDDAB				100% Marine, <0.5% of total catch
FLOUNDER, SOUTHERN				100% Estuarine, <0.5% of total catch
FLOUNDER, STARRY				100% Estuarine, <0.5% of total catch
FLOUNDER, SUMMER				100% Estuarine, 1.9% of total catch
FLOUNDER, WINDOWPANE				100% Estuarine, <0.5% of total catch
FLOUNDER, WINTER				100% Estuarine, 0.7% of total catch
FLOUNDER, WITCH				100% Marine, <0.5% of total catch
FLOUNDER, YELLOWTAIL				100% Marine, 0.5% of total catch

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
FLOUNDER,ATLANTIC,PLAICE				100% Marine, 0.5% of total catch
FLOUNDER,PACIFIC,SANDDAB				100% Marine, <0.5% of total catch
FLOUNDERS, RIGHTEYE				50% Marine/50% Estuarine, <0.5% of total catch
SOLE, BUTTER				100% Marine, <0.5% of total catch
SOLE, CURLFIN				100% Marine, <0.5% of total catch
SOLE, DOVER				100% Marine, <0.5% of total catch
SOLE, ENGLISH				100% Estuarine, <0.5% of total catch
SOLE, FANTAIL				100% Marine, <0.5% of total catch
SOLE, FLATHEAD				100% Estuarine, 7.5% of total catch
SOLE, PETRALE				100% Marine, <0.5% of total catch
SOLE, REX				100% Marine, 1.9% of total catch
SOLE, ROCK				100% Marine, 18.1% of total catch
SOLE, SAND				100% Estuarine, <0.5% of total catch
SOLE, YELLOWFIN				100% Marine, 37.3% of total catch
HALIBUT, ATLANTIC				100% Marine, <0.5% of total catch
HALIBUT, CALIFORNIA				100% Estuarine, <0.5% of total catch
HALIBUT, GREENLAND				100% Marine, 1.4% of total catch
HALIBUT, PACIFIC				75% Marine (adults)/25% Estuarine (young), 9.2% of total catch
<b>Flounder</b>	<b>0.85</b>	<b>0</b>	<b>0.15</b>	<b>Apportioned with NOAA landings data.</b>
FLOUNDER, ARROWTOOTH				100% Marine, 78.5% of total catch
FLOUNDER, FOURSPOT				100% Marine, <0.5% of total catch
FLOUNDER, PACIFIC, SANDDAB				100% Marine, <0.5% of total catch
FLOUNDER, SOUTHERN				100% Estuarine, 1.7% of total catch
FLOUNDER, STARRY				100% Estuarine, <0.5% of total catch
FLOUNDER, SUMMER				100% Estuarine, 9.4% of total catch
FLOUNDER, WINDOWPANE				100% Estuarine, <0.5% of total catch
FLOUNDER, WINTER				100% Estuarine, 0.3% of total catch
FLOUNDER, WITCH				100% Marine, 1.5% of total catch
FLOUNDER, YELLOWTAIL				100% Marine, 2.5% of total catch
FLOUNDER,ATLANTIC,PLAICE				100% Marine, 2.4% of total catch
FLOUNDER,PACIFIC,SANDDAB				100% Marine, <0.5% of total catch
FLOUNDERS, RIGHTEYE				50% Marine/50% Estuarine, <0.5% of total catch
<b>Sole</b>	<b>0.89</b>	<b>0</b>	<b>0.11</b>	<b>Apportioned with NOAA landings data.</b>
SOLE, BUTTER				100% Marine, <0.5% of total catch
SOLE, CURLFIN				100% Marine, <0.5% of total catch
SOLE, DOVER				100% Marine, 5.6% of total catch
SOLE, ENGLISH				100% Estuarine, <0.5% of total catch
SOLE, FANTAIL				100% Marine, <0.5% of total catch
SOLE, FLATHEAD				100% Estuarine, 10.8% of total catch
SOLE, PETRALE				100% Marine, 0.6% of total catch

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
SOLE, REX				100% Marine, 2.7% of total catch
SOLE, ROCK				100% Marine, 26.1% of total catch
SOLE, SAND				100% Estuarine, <0.5% of total catch
SOLE, YELLOWFIN				100% Marine, 54.0% of total catch
<b>Halibut</b>	<b>0.78</b>	<b>0</b>	<b>0.22</b>	<b>Apportioned with NOAA landings data.</b>
HALIBUT, ATLANTIC				100% Marine, <0.5% of total catch
HALIBUT, CALIFORNIA				100% Estuarine, 0.9% of total catch
HALIBUT, GREENLAND				100% Marine, 13.0% of total catch
HALIBUT, PACIFIC				75% Marine (adults)/25% Estuarine (young), 86.0% of total catch
<b>Haddock</b>	<b>0.945</b>	<b>0.05</b>	<b>0.006</b>	
Haddock				100% Marine. Weighted 50% of group.
Blowfish				Not consumed in US
Burbot				100% Freshwater. Weighted 5% of group.
Cusk				100% Marine. Weighted 5% of group.
Hake				9 species: 8 are marine (89%) and 1 is estuarine (11%). Weighted 5% of group.
Ling				100% Marine. Weighted 5% of group.
Monkfish				100% Marine. Weighted 5% of group.
Scrod				100% Marine. Weighted 25% of group.
<b>Herring</b>	<b>0.304</b>	<b>0.01</b>	<b>0.686</b>	
Herring				Apportioned with NOAA landings data. (0.6%M/0.3\$FW/99.1%Est) Weighted 60% of group.
HERRING, ATLANTIC				100% Estuarine, 64.3% of total catch
HERRING, ATLANTIC THREAD				100% Marine, <0.5% of total catch
HERRING, BLUEBACK				100% Estuarine, <0.5% of total catch
HERRING, LAKE OR CISCO				100% Freshwater, <0.5% of total catch
HERRING, PACIFIC				100% Estuarine, 34.6% of total catch
HERRING, ROUND				100% Marine, <0.5% of total catch
HERRINGS				catch-all category, apportioned according to above catch proportions, <0.5% of total catch
Milkfish				100% Marine. Weighted 30% of group.
Shad				6 main species. 92% Estuarine/8% Freshwater (Alewife if 50% FW). Weighted 10% of group.
<b>Jellyfish</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100% Estuarine</b>
<b>Lobster</b>	<b>0.044</b>	<b>0</b>	<b>0.956</b>	<b>Apportioned with NOAA landings data.</b>
LOBSTER, AMERICAN				100% Estuarine, 95.0% of total catch
LOBSTER, BANDED SPINY				100% Marine, <0.5% of total catch
LOBSTER, CALIFORNIA SPINY				100% Estuarine, 0.6% of total catch
LOBSTER, CARIBBEAN SPINY				100% Marine, 4.4% of total catch
LOBSTER, SLIPPER				100% Marine, <0.5% of total catch

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
<b>Mackerel</b>	<b>0.411</b>	<b>0</b>	<b>0.589</b>	
Mackerel				Apportioned with NOAA landings data. Weighted 90% of group.
MACKEREL, ATLANTIC				100% Estuarine, 63.4% of total catch
MACKEREL, CHUB				100% Marine, 13.8% of total catch
MACKEREL, FRIGATE				100% Marine, <0.5% of total catch
MACKEREL, KING				100% Marine, 1.7% of total catch
MACKEREL, KING AND CERO				100% Marine, 11.1% of total catch
MACKEREL, SPANISH				100% Marine, 10.0% of total catch
Garfish				100% Estuarine. Weighted 2% of group.
Ono/Wahoo				100% Marine. Weighted 4% of group.
Needlefish				56% Marine/44% Estuarine (9 species, 5 marine and 4 estuarine). Weighted 4% of group.
<b>Mullet</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100% Estuarine</b>
<b>Mussel</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100% Estuarine</b>
<b>Rockfish/Ocean Perch</b>	<b>0.925</b>	<b>0</b>	<b>0.075</b>	
Ocean Perch				100% Marine. Weighted 15% of group.
Bocaccio				100% Estuarine. Weighted 5% of group.
Menpachi				100% Marine. Weighted 5% of group.
Orange roughy				100% Marine. Weighted 35% of group.
Redfish				100% Marine. Weighted 15% of group.
Rockfish				70 species, approximately half are found in estuaries (in addition to marine habitats) 50% Marine/50% Estuarine. Weighted 5% of group.
<b>Octopus</b>	<b>0.62</b>	<b>0</b>	<b>0.38</b>	<b>8 species commonly consumed in US. 3 are 100% estuarine and 5 are 100% Marine. NOAA database does not speciate.</b>
<b>Oyster</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100% Estuarine</b>
<b>Perch</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>100% Freshwater</b>
Perch				100% Freshwater
Bluegill				100% Freshwater
Crappie				100% Freshwater
Sunfish				100% Freshwater
Bass				100% Freshwater
Walleye				100% Freshwater
<b>Pike</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>100% Freshwater</b>
Pike				100% Freshwater
Muskellunge				100% Freshwater
Pickrel				100% Freshwater
<b>Pompano</b>	<b>0.661</b>	<b>0.002</b>	<b>0.338</b>	
Pompano				Florida (100% Est) is 97% of total catch, African (100% Marine) is 3% of total catch. Weighted 3% of group.

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
Akule				100% Marine. Weighted 3% of group.
Blackfish				2 main species: 1 is marine, near-coast (100% Estuarine) and the other is mainly estuarine and partially freshwater. 95% Estuarine/5% FW. Weighted 3% of group.
Bluefish				100% Estuarine. Weighted 3% of group.
Butterfish				100% Estuarine. Weighted 3% of group.
Dolphinfish				100% Marine. Weighted 10% of group.
Jack				100% Marine. Weighted 3% of group.
Mahimahi				100% Marine. Weighted 35% of group.
Papio				100% Marine. Weighted 3% of group.
Parrot fish				100% Marine. Weighted 3% of group.
Sablefish				100% Marine. Weighted 3% of group.
Scad				100% Marine. Weighted 3% of group.
Tilefish				100% Marine. Weighted 3% of group.
Ulua				100% Estuarine. Weighted 3% of group.
Yellowtail				100% Estuarine. Weighted 19% of group.
<b>Porgy</b>	<b>0.981</b>	<b>0</b>	<b>0.019</b>	<b>Apportioned with NOAA landings data.</b>
PORGY, JOLTHEAD				100% Marine, <0.5% of total catch
PORGY, KNOBBED				100% Marine, <0.5% of total catch
PORGY, RED				100% Marine, 1.7% of total catch
SCUP				100% Marine, 43.8% of total catch
SCUPS OR PORGIES				100% Marine, 1.7% of total catch
SHEEPSHEAD				100% Marine, 8.2% of total catch
SNAPPER, BLACK				100% Marine, <0.5% of total catch
SNAPPER, BLACKFIN				100% Marine, <0.5% of total catch
SNAPPER, CUBERA				100% Estuarine, <0.5% of total catch
SNAPPER, DOG				100% Estuarine, <0.5% of total catch
SNAPPER, GRAY				100% Estuarine, 1.3% of total catch
SNAPPER, LANE				100% Marine, <0.5% of total catch
SNAPPER, MUTTON				100% Estuarine, 0.6% of total catch
SNAPPER, QUEEN				100% Marine, <0.5% of total catch
SNAPPER, RED				100% Marine, 14.3% of total catch
SNAPPER, SILK				100% Marine, <0.5% of total catch
SNAPPER, VERMILION				100% Marine, 17.9% of total catch
SNAPPER, YELLOWTAIL				100% Marine, 8.6% of total catch
SNAPPERS				catch-all category for snapper, apportioned according to above catch proportions, 1.2% of total catch
<b>Roe/Caviar</b>	<b>0.085</b>	<b>0.235</b>	<b>0.68</b>	
Roe				10 species commonly used. Salmon, Alewife, Paddlefish, Bowfin, Pike, Freshwater Whitefish, Shad = 100% FW. Mullet = 100% Est. Capelin, Cod = 100% Marine. Total 70%FW/10%Est/20%Marine. Weighted 40% of group.
Caviar				Sturgeon eggs. 100% Estuarine. Weighted 60% of group.

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
<b>Salmon</b>	<b>0.96</b>	<b>0.005</b>	<b>0.035</b>	
Salmon				Partially apportioned with NOAA data. Weighted 99% of group.
				Landlocked sockeye salmon, 100% Freshwater. Catch is <1% of total salmon catch.
				Kokanee
				SALMON, CHINOOK
				100% Marine. 1.5% of total catch.
				SALMON, CHUM
				Some populations spend many months in estuaries. 85% Marine/15% Estuarine. 15.3% of total catch
				SALMON, COHO
				Some populations spend many months in estuaries. 85% Marine/15% Estuarine. 4.4% of total catch
				SALMON, PINK
				100% Marine. 44.6% of total catch.
				SALMON, SOCKEYE
				100% Marine. 34.1% of total catch.
				Saltwater trout
				100% Estuarine. Weighted 1% of group.
<b>Sardine</b>	<b>0.9</b>	<b>0</b>	<b>0.1</b>	
Pacific sardine				90% of catch, 100% marine
Round sardinella				10% of catch, 100% estuarine
<b>Scallop</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100% Estuarine</b>
<b>Sea Bass</b>	<b>0.925</b>	<b>0.025</b>	<b>0.05</b>	
Sea bass				5 species commonly consumed in US. 100% Marine. Weighted 85% of group.
Grouper				150 species, some marine only, some estuarine and marine. 50% Marine/50% Estuarine. Weighted 10% of group.
Striped Bass				50% Estuarine/50% Freshwater. Weighted 10% of group.
Wreckfish				100% Marine. Weighted 10% of group.
<b>Shark</b>	<b>0.866</b>	<b>0</b>	<b>0.134</b>	
Shark				8 species consumed. 7 marine, 1 estuarine/marine. 87.5% Marine/12.5% Estuarine. Weighted 90% of group.
Dogfish				16 species consumed. 14 marine, 2 estuarine/marine. 87.5% Marine/12.5% Estuarine. Weighted 5% of group.
Grayfish				5 species consumed. 3 marine, 2 estuarine/marine. 60% Marine/40% Estuarine. Weighted 5% of group.
<b>Shrimp</b>	<b>0.176</b>	<b>0</b>	<b>0.824</b>	<b>Apportioned with NOAA landings data.</b>
SHRIMP, BROWN				100% Estuarine, 36.4% of total catch.
SHRIMP, MARINE, OTHER				100% Marine, 2.6% of total catch.
SHRIMP, OCEAN				100% Marine, 13.4% of total catch.
SHRIMP, PACIFIC ROCK				100% Marine, <0.5% of total catch.
SHRIMP, PENAEID				100% Estuarine, <0.5% of total catch.
SHRIMP, PINK				100% Estuarine, 3.2% of total catch.
SHRIMP, ROCK				100% Marine, 1.1% of total catch.
SHRIMP, ROYAL RED				100% Marine, <0.5% of total catch.
SHRIMP, SEABOB				100% Estuarine, <0.5% of total catch.

NHANES fish group and comprising species	Proportion			Details*
	Marine	Freshwater	Estuarine	
SHRIMP, SPOT				100% Estuarine, <0.5% of total catch.
SHRIMP, WHITE				100% Estuarine, 40.2% of total catch.
SHRIMP,PANDALID				100% Estuarine, 0.9% of total catch.
SHRIMP, FW				100% Freshwater, <0.001% of total catch
SHRIMP, DENDROBRANCHIATA				catch-all category, apportioned according to above catch proportions, 0.9% of total catch
<b>Snail</b>	<b>0.45</b>	<b>0.1</b>	<b>0.45</b>	<b>Species found in all environments.</b>
Limpet				80% marine species, 20% freshwater species.
Conch				Half species 100% Marine, half 100% marine but harvested near coast.
Moon snail				Half species 100% Marine, half 100% marine but harvested near coast.
<b>Squid</b>	<b>0.8</b>	<b>0</b>	<b>0.2</b>	
Squid				5 species commonly caught. 4 marine and 1 estuarine.
Cuttlefish				Marine. Not found in US waters.
<b>Sturgeon</b>	<b>0</b>	<b>0.42</b>	<b>0.58</b>	<b>6 species commonly caught. 1 FW/Est, 2 FW, 3 Est</b>
<b>Swordfish</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>100% Marine</b>
Swordfish				100% Marine
Marlin				100% Marine
<b>Tilapia</b>	<b>0</b>	<b>0.5</b>	<b>0.5</b>	<b>Invasive in US; established populations in some freshwater lakes as well as estuaries</b>
<b>Trout</b>	<b>0.106</b>	<b>0.869</b>	<b>0.025</b>	
Trout				100% Freshwater, weighted 70% of group
Chub				100% Freshwater, weighted 5% of group
Cisco				4 species: 1 FW, 1 Marine/Est, 1 Est, 1 FW/Est (37.5% FW, 50% Est, 12.5% marine, weighted 5% of group)
Lake Herring				100% Freshwater, weighted 5% of group
Steelhead				100% Marine, weighted 10% of group
Freshwater Whitefish				100% Freshwater, weighted 5% of group
<b>Whitefish</b>	<b>0.877</b>	<b>0</b>	<b>0.123</b>	<b>Based on apportionment of cod, whiting, haddock, hake, pollock, sole, flounder, and halibut</b>
<b>Tuna, canned</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>100% Marine</b>
Tuna, fresh	1	0	0	100% Marine
<b>Whelk</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>100% Estuarine</b>
<b>Whiting</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>100% Marine</b>
<b>Fish not specified</b>	<b>0.52</b>	<b>0.16</b>	<b>0.32</b>	<b>Apportioned according to overall percentages of all specified species</b>
<b>Breaded Fish Products</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>100% Marine (Pollock/Cod)</b>

\*Weighted percentages come from number of reports in 2007-08 NHANES AMPM file. Unless a fish is not known to be consumed in the US, no fish were assigned a 0 weight as they could be reported consumed in other NHANES releases. We only had access to the 2007-08 AMPM file.